

ABSTRACT

An apparatus for measuring an operating parameter of a relay armature operating a pair of relay contacts, and for controlling the voltage that occurs between the pair of relay contacts when they open or close. The apparatus includes a microcontroller that senses a reference voltage, and a sensed voltage signal that comprises a voltage component representing a relay coil voltage, a power supply voltage component, and a voltage component induced by a motion of the armature. The microcontroller uses discrete digital samples of the signals to deduce the operating parameter. The microcontroller provides a control signal to cause the relay to open or close the relay contacts at a time when a predefined voltage occurs therebetween. The predefined voltage can be substantially zero volts. Methods of use of the apparatus to control the opening and closing of relay contacts are described.